

# APPARATUS AND METHODS FOR WASHING THE CORED AREAS OF LETTUCE HEADS DURING HARVEST

## BACKGROUND OF THE INVENTION

This invention relates to apparatus and methods for washing the cored area of a lettuce head.

The field to which the invention relates is that of agricultural equipment and methods used in harvesting operations.

## BRIEF SUMMARY OF THE INVENTION

The invention is an apparatus and method for washing a plurality of cored lettuce heads as they are harvested in the field. The apparatus comprises a conveyer forming a loop, support platforms attached to the conveyer with at least one lettuce head guide connected to each support platform, and an aqueous solution spraying system fixedly attached at a point along said conveyer loop. The claimed method involves the steps of placing at least one cored lettuce head onto a conveyer, conveying the lettuce head(s) to an aqueous solution spraying system, delivering an aqueous solution into the core hole(s) of the lettuce head(s) for a time and at a pressure sufficient to wash the core hole(s), and removing the cored lettuce head(s) from the conveyer.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a side elevation view of the apparatus for washing the cores of cored lettuce attached to a tractor.

Fig. 2 shows a top plan view of a section of the apparatus of fig. 1.

Fig. 3 is an exploded side elevation view in cross section of the hinged area connecting the middle and proximal end segments of the apparatus shown in fig. 1.

- Fig. 4 is an exploded side elevation view in cross section of the hinged area connecting the central and distal end segments of the apparatus shown in fig. 1.
- Fig. 5 is a side elevation view in cross section of the wash chamber in the apparatus of Figs. 1-4.
- Fig. 6 is an exploded side elevation view in cross section of the unhinged end of the distal end segment in the apparatus of Figs. 1-5.
- Fig. 7 is an exploded side elevation view in cross section of the unhinged end of the proximal end segment in the apparatus of Fig 6.
- Fig. 8 is an exploded side elevation view in cross section of the unhinged end of the proximal end segment in the apparatus of Fig. 6 showing a removal finger.
- Fig. 9. is an end view of the unhinged end of the proximal end segment showing the removal fingers.

#### DETAILED DESCRIPTION OF THE INVENTION

Fig 1 shows an embodiment of washing apparatus 400 which includes three hinged sections - a distal end segment 406, a middle segment 407, and a proximal end segment 408. Lifting cylinders 409 and 410, powered and controlled hydraulically, rotate distal end segment 406 and proximal end segment 408 to desired angles of inclination. See figures 3 and 4 for an example. Washing chamber 411 is located on proximal end segment 408 adjacent to connecting hinge 412.

Fig. 2 shows lettuce head washing apparatus 400 as viewed from above. Apparatus 400 includes at least one support platform 401 which includes a plurality of openings 402. Platforms 401 support and are connected to guides 403. Guides 403 orient the lettuce heads so that the aqueous solution is delivered to the core holes of the lettuce heads. In figure 2, a preferred

embodiment of guide 403 is shown as including three L-shaped vanes 404, that project upwardly from platforms 401. Guides 403 may also be circular, posts, spikes, or any other suitable holder used to support and orient the lettuce heads.

Platform 401 is attached at each end to a double pitch chain 405 that forms a loop. Preferably, apparatus 400 includes a plurality of support platforms 401, each with at least two guides 403, attached at intervals along chain 405, such as shown in figure 2. In some embodiments platforms 401 are detachable from chain 405. The combination of guides 403, platforms 401, chains 405 and associated frame and driving mechanisms form a looped belt, sometimes called a harvester belt, that moves along an elliptical or other path. Sprockets 423, as shown for example in figure 6, are powered and controlled hydraulically to move chain 405, thereby moving attached platforms 401 and connected guides 403. Preferably the belt is attached, at one end, to a hitch of a puller vehicle e.g. a tractor of 40 horse power or greater.

Guides 403 are conveyed in a substantially upright position from unhinged end 413 of distal end segment 406 towards unhinged end 414 of proximal end segment 408. In a preferred embodiment distal end segment 406 is maintained in a horizontal and co-linear position with middle segment 407 during operation. Workers place cored heads of lettuce on guides 403 as they traverse distal end segment 406 and central segment 407 in an upright position. Cored lettuce heads on guides 403 then travel through wash chamber 411 to unhinged end 414 of proximal end segment 408.

Figure 5 shows wash chamber 411. Wash chamber 411 includes one or more spray nozzles 418 that continually spray or otherwise deliver an aqueous lettuce head washing solution 419 into the core holes of the lettuce heads as they travel over nozzles 418. Solution 419 is pumped to nozzles 418 through hoses 422 from supply tank 421 located below wash chamber 411. Solution 419 may be pumped by any suitable pump. Preferred embodiments use a centrifugal pump powered and controlled hydraulically. Solution 419 emerges from nozzles 418 under pressure and travels upward as spray 420 through openings in platforms 401 into the core holes of lettuce heads. Solution 419 which drains from the lettuce is collected, filtered, and recycled by supply tank 421. A preferred embodiment of supply tank 421 used to collect, filter and recycle solution 419 is disclosed in the currently pending U.S. patent application No.

09/144,972 filed September 1<sup>st</sup>, 1998 by applicants Richard S. Brown and Eugene D. Rizzo. That application is hereby incorporated by reference.

5 The level of solution in supply tank 421 is kept at a predetermined level by a float valve. Supply tank 421 may be connected to a tractor mounted nurse tank. Aqueous solution 419 may be pumped from the nurse tank to supply tank 421 by any pump. Preferred embodiments use a centrifugal pump, powered and controlled hydraulically.

10 In some embodiments, a single lettuce head passes over one or more nozzles 418, repeatedly washing the core hole. Nozzles 418 may deliver washing solution 419 at either high pressure and low volume, or low pressure and high volume. Preferred embodiments include both types of nozzles 418.

15 After exiting washing chamber 411, the lettuce heads are conveyed to unhinged end 414 of proximal end segment 408. Proximal end segment 408 is preferably elevated, as shown in figure 1, at an inclination angle of 25-35 degrees. The washed lettuce heads will thereby be elevated for deposit onto a conveyer or into produce bins. At unhinged end 414 the cored lettuce heads on guides 403 are rotated through an angle to a substantially inverted position 415, as shown, for example, in figure 7. In inverted position 415 the cored lettuce heads detach from guide 403. At least one fixed removing finger 424, as shown, for example, in figures 8 and 9, placed adjacent to unhinged end 414 may be used to assist in unseating the lettuce heads. Inverted guides 403 return to unhinged distal end 413 of the harvester belt. There guides 403 rotate through an angle to a substantially upright position. For an example, see figure 6. Guide 403 then travels back towards proximal end 408 of the harvester belt for receipt of additional cored lettuce heads to be washed.

**WHAT IS CLAIMED IS:**

1. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
at least one lettuce head guide connected to said at least one support platform; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.
2. The apparatus of claim 1 wherein said conveyer further comprises  
a middle segment with a first end and a second end;  
a distal end segment rotatably attached to said first end;  
a proximal end segment rotatably attached to said second end;  
a rotator to rotate and hold in place at a desired angle said distal end segment; and  
a rotator to rotate and hold in place at a desired angle said proximal end segment.
3. The apparatus of claim 2 wherein said aqueous solution spraying system is fixedly attached  
at a point along said proximal end segment .
4. The apparatus of claim 1, 2, or 3 wherein said conveyer further comprises a double pitch  
attachment style chain.
5. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
at least one lettuce head guide connected to said at least one support platform;

said lettuce head guide comprising outward facing vanes; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

5           6.   An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer through a double pitch  
attachment style chain;  
10           at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising outward facing vanes; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

15           7.   An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
said conveyer comprising;  
20           (A)   a middle segment with a first end and a second end;  
              (B)   a distal end segment rotatably attached to said first end;  
              (C)   a proximal end segment rotatably attached to said second end;  
              (D)   a rotator to rotate and hold in place at a desired angle said distal  
                    end segment; and  
25           (E)   a rotator to rotate and hold in place at a desired angle said proximal  
                    end segment;

at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising outward facing vanes; and  
an aqueous solution spraying system fixedly attached at a point along said

conveyer loop.

8. An apparatus for washing a plurality of cored heads of lettuce comprising
- 5 a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer through a double pitch  
attachment style chain;  
said conveyer comprising;
- 10 (A) a middle segment with a first end and a second end;  
(B) a distal end segment rotatably attached to said first end;  
(C) a proximal end segment rotatably attached to said second end;  
(D) a rotator to rotate and hold in place at a desired angle said distal  
end segment; and  
15 (E) a rotator to rotate and hold in place at a desired angle said proximal  
end segment;
- at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising outward facing vanes; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

9. An apparatus for washing a plurality of cored heads of lettuce comprising
- 20 a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
said conveyer comprising;
- 25 (A) a middle segment with a first end and a second end;  
(B) a distal end segment rotatably attached to said first end;  
(C) a proximal end segment rotatably attached to said second end;  
(D) a rotator to rotate and hold in place at a desired angle said distal

end segment; and

(E) a rotator to rotate and hold in place at a desired angle said proximal end segment;

at least one lettuce head guide connected to said at least one support platform;

said lettuce head guide comprising outward facing vanes; and

an aqueous solution spraying system fixedly attached at a point along said proximal end segment.

10. An apparatus for washing a plurality of cored heads of lettuce comprising

a conveyer forming a loop with a distal end and a proximal end;

at least one support platform having at least one opening;

said at least one support platform attached through a double pitch attachment style chain to said conveyer;

said conveyer comprising;

(A) a middle segment with a first end and a second end;

(B) a distal end segment rotatably attached to said first end;

(C) a proximal end segment rotatably attached to said second end;

(D) a rotator to rotate and hold in place at a desired angle said distal end segment; and

(E) a rotator to rotate and hold in place at a desired angle said proximal end segment;

at least one lettuce head guide connected to said at least one support platform;

said lettuce head guide comprising outward facing vanes; and

an aqueous solution spraying system fixedly attached at a point along said proximal end segment.

11. An apparatus for washing a plurality of cored heads of lettuce comprising

a conveyer forming a loop with a distal end and a proximal end;

at least one support platform having at least one opening;



said at least one support platform attached to said conveyer;  
at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising an elliptical ring; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

12. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer through a double pitch  
attachment style chain;  
at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising an elliptical ring; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

13. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
said conveyer comprising;  
(A) a middle segment with a first end and a second end;  
(B) a distal end segment rotatably attached to said first end;  
(C) a proximal end segment rotatably attached to said second end;  
(D) a rotator to rotate and hold in place at a desired angle said distal  
end segment; and  
(E) a rotator to rotate and hold in place at a desired angle said proximal  
end segment;  
at least one lettuce head guide connected to said at least one support platform;

said lettuce head guide comprising an elliptical ring; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

- 5 14. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer through a double pitch  
attachment style chain;  
10 said conveyer comprising;  
(A) a middle segment with a first end and a second end;  
(B) a distal end segment rotatably attached to said first end;  
(C) a proximal end segment rotatably attached to said second end;  
(D) a rotator to rotate and hold in place at a desired angle said distal  
15 end segment; and  
(E) a rotator to rotate and hold in place at a desired angle said proximal  
end segment;  
at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising an elliptical ring; and  
20 an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

- 25 15. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
said conveyer comprising;  
(A) a middle segment with a first end and a second end;  
(B) a distal end segment rotatably attached to said first end;

- (C) a proximal end segment rotatably attached to said second end;
- (D) a rotator to rotate and hold in place at a desired angle said distal end segment; and
- (E) a rotator to rotate and hold in place at a desired angle said proximal end segment;

at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising an elliptical ring; and  
an aqueous solution spraying system fixedly attached at a point along said proximal end segment.

16. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached through a double pitch attachment style chain to said conveyer;  
said conveyer comprising;
- (A) a middle segment with a first end and a second end;
  - (B) a distal end segment rotatably attached to said first end;
  - (C) a proximal end segment rotatably attached to said second end;
  - (D) a rotator to rotate and hold in place at a desired angle said distal end segment; and
  - (E) a rotator to rotate and hold in place at a desired angle said proximal end segment;
- at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising an elliptical ring; and  
an aqueous solution spraying system fixedly attached at a point along said proximal end segment.

17. An apparatus for washing a plurality of cored heads of lettuce comprising

a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising a spike; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

18. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer through a double pitch  
attachment style chain;  
at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising a spike; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

19. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
said conveyer comprising;  
(A) a middle segment with a first end and a second end;  
(B) a distal end segment rotatably attached to said first end;  
(C) a proximal end segment rotatably attached to said second end;  
(D) a rotator to rotate and hold in place at a desired angle said distal  
end segment; and  
(E) a rotator to rotate and hold in place at a desired angle said proximal

end segment;

at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising a spike; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

20. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer through a double pitch  
attachment style chain;  
said conveyer comprising;
- (A) a middle segment with a first end and a second end;
  - (B) a distal end segment rotatably attached to said first end;
  - (C) a proximal end segment rotatably attached to said second end;
  - (D) a rotator to rotate and hold in place at a desired angle said distal  
end segment; and
  - (E) a rotator to rotate and hold in place at a desired angle said proximal  
end segment;
- at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising a spike; and  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop.

21. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
said conveyer comprising;

- (A) a middle segment with a first end and a second end;  
(B) a distal end segment rotatably attached to said first end;  
(C) a proximal end segment rotatably attached to said second end;  
(D) a rotator to rotate and hold in place at a desired angle said distal end segment; and  
(E) a rotator to rotate and hold in place at a desired angle said proximal end segment;

at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising a spike; and  
an aqueous solution spraying system fixedly attached at a point along said proximal end segment.

22. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached through a double pitch attachment style chain to said conveyer;  
said conveyer comprising;

- (A) a middle segment with a first end and a second end;  
(B) a distal end segment rotatably attached to said first end;  
(C) a proximal end segment rotatably attached to said second end;  
(D) a rotator to rotate and hold in place at a desired angle said distal end segment; and  
(E) a rotator to rotate and hold in place at a desired angle said proximal end segment;

at least one lettuce head guide connected to said at least one support platform;  
said lettuce head guide comprising a spike; and  
an aqueous solution spraying system fixedly attached at a point along said proximal end segment.

23. The apparatus of claim 1 further comprising at least one finger located substantially adjacent to said proximal end.

5 24. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
at least one lettuce head guide connected to said at least one support platform; and  
10 an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop;  
said aqueous solution spraying system comprising;  
a tank for holding an aqueous solution;  
a pump;  
15 said pump delivering said aqueous solution under pressure to  
at least one nozzle.

20 25. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
at least one lettuce head guide connected to said at least one support platform;  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop;  
25 said aqueous solution spraying system comprising;  
a tank for holding an aqueous solution;  
a determiner of a level of said aqueous solution in said tank;  
said determiner connected to an inlet valve;  
said inlet valve connected to a reservoir containing said aqueous solution;  
a pump; and

said pump delivering said aqueous solution under pressure to  
at least one nozzle.

- 5 26. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
at least one lettuce head guide connected to said at least one support platform;  
10 an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop;  
said aqueous solution spraying system comprising;  
a tank for holding an aqueous solution;  
a pump;  
15 said pump delivering said aqueous solution under pressure to  
at least one nozzle; and  
where said at least one nozzle delivers said aqueous solution at a high pressure and  
a low volume.

- 20 27. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
at least one lettuce head guide connected to said at least one support platform;  
25 an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop;  
said aqueous solution spraying system comprising;  
a tank for holding an aqueous solution;  
a pump;  
said pump delivering said aqueous solution under pressure to



at least one nozzle;

where said at least one nozzle delivers said aqueous solution at a low pressure and a high volume.

- 5 28. An apparatus for washing a plurality of cored heads of lettuce comprising  
a conveyer forming a loop with a distal end and a proximal end;  
at least one support platform having at least one opening;  
said at least one support platform attached to said conveyer;  
10 at least one lettuce head guide connected to said at least one support platform;  
an aqueous solution spraying system fixedly attached at a point along said  
conveyer loop;  
said aqueous solution spraying system comprising;  
a tank for holding an aqueous solution;  
a pump;  
15 said pump delivering said aqueous solution under pressure to  
at least two nozzles at least one of which delivers said aqueous solution at a high  
pressure and a low volume and at least one of which delivers said aqueous solution  
at a low pressure and a high volume.

- 20 29. A method for washing at least one head of lettuce with a cored hole comprising the steps  
of

placing said at least one cored lettuce head in a position such that the cored hole  
faces substantially downward;

25 conveying said at least one cored lettuce head to an aqueous solution spraying  
system;

delivering an aqueous solution into said core hole for a time and at a pressure  
sufficient to wash said core hole; and

removing said at least one cored lettuce head from said position.

30. The method of claim 29 wherein said placing step comprises seating said cored lettuce head on a guide which has a path for said aqueous solution, said guide being attached to a support platform which has at least one opening.

5 31. The method of claim 30 wherein said conveying step comprises conveying said guide along a path forming a loop.

10 32. The method of claim 31 wherein said path forming a loop has a distal end, and a proximal end, such that said guide is conveyed in a substantially upright position from said distal end to said proximal end, and in a substantially inverted position from said proximal end to said distal end.

33. The method of claim 32 wherein said proximal end is elevated in relation to said distal end.

15 34. The method of claim 29 where said step of delivering an aqueous solution into said core hole further comprises using

a tank containing said aqueous solution;

at least one nozzle; and

a pump to deliver said aqueous solution to said at least one nozzle.

20 35. The method of claim 34 where said at least one nozzle sprays said aqueous solution at a high pressure and a low volume.

25 36. The method of claim 34 where said at least one nozzle sprays said aqueous solution at a low pressure and a high volume.

37. The method of claim 34 where at least two nozzles are used, where at least one nozzle sprays said aqueous solution at a high pressure and a low volume, and where at least one nozzle sprays said aqueous solution at a low pressure and a high volume.

38. The method of claim 34 comprising the further steps of collecting, filtering, and recycling said aqueous solution which drains from said lettuce heads.

5 39. The method of claim 34 comprising the further step of maintaining a level of said aqueous solution in said tank at a predetermined level.

40. The method of claim 39 wherein said level of said aqueous solution is maintained by using a float level which is connected to an inlet valve connected to a reservoir tank.

10 41. The method of claim 30 wherein the step of removing said at least one lettuce head from said guide further comprises rotating said lettuce head through an angle to a substantially inverted position. *90°*

15 42. The method of claim 41 wherein the step of removing said at least one lettuce head from said guide further comprises using at least one finger. *thumb*

## ABSTRACT OF THE DISCLOSURE

5 An apparatus and method for washing a plurality of cored lettuce heads as they are harvested in the field is disclosed. The apparatus incorporates a multi-segment hinged conveyer forming a loop, at least one support platform having an opening, at least one lettuce head guide connected to the support platform and an aqueous solution spraying system. Workers harvest lettuce heads, core the lettuce heads and then place them on the lettuce head guides which are moving along the conveyer. The lettuce heads are conveyed to an aqueous solution spraying system which washes the cored areas of the lettuce heads. The lettuce heads are then removed from the conveyer into a produce bin.

10

Figure 1

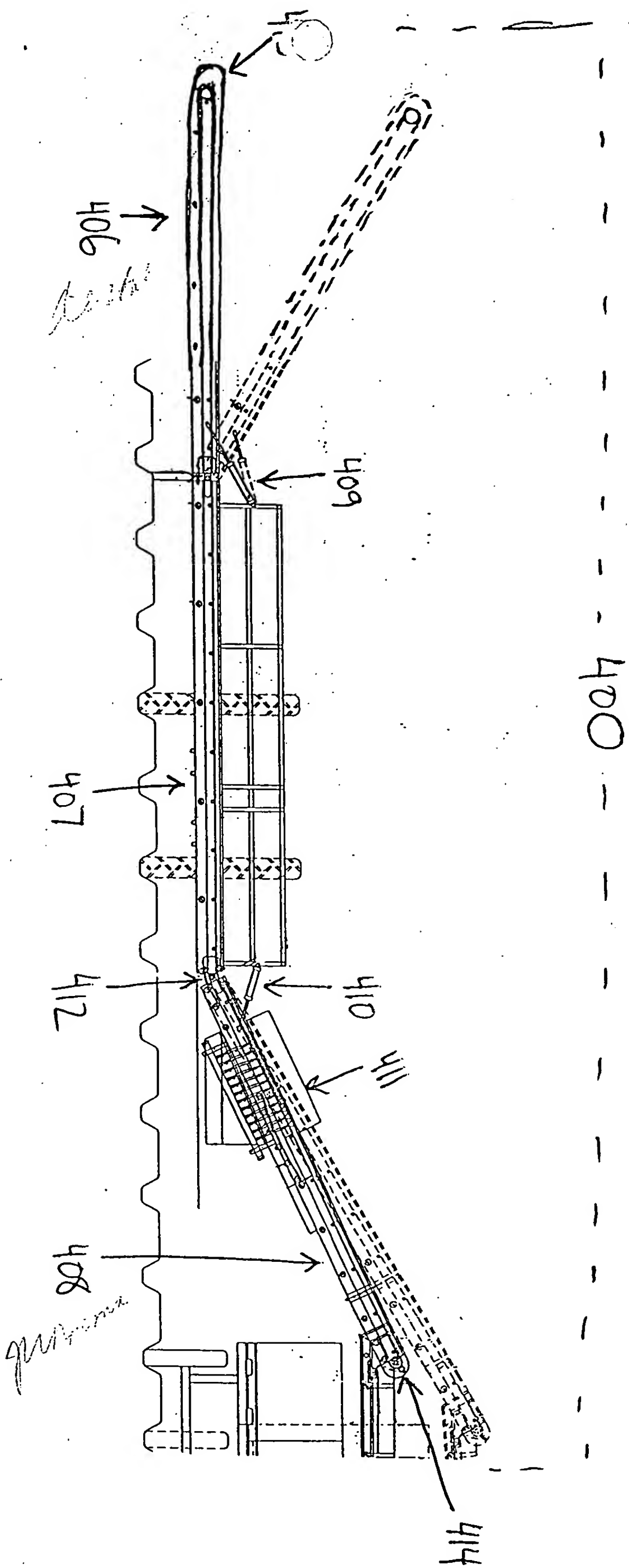


Figure 2

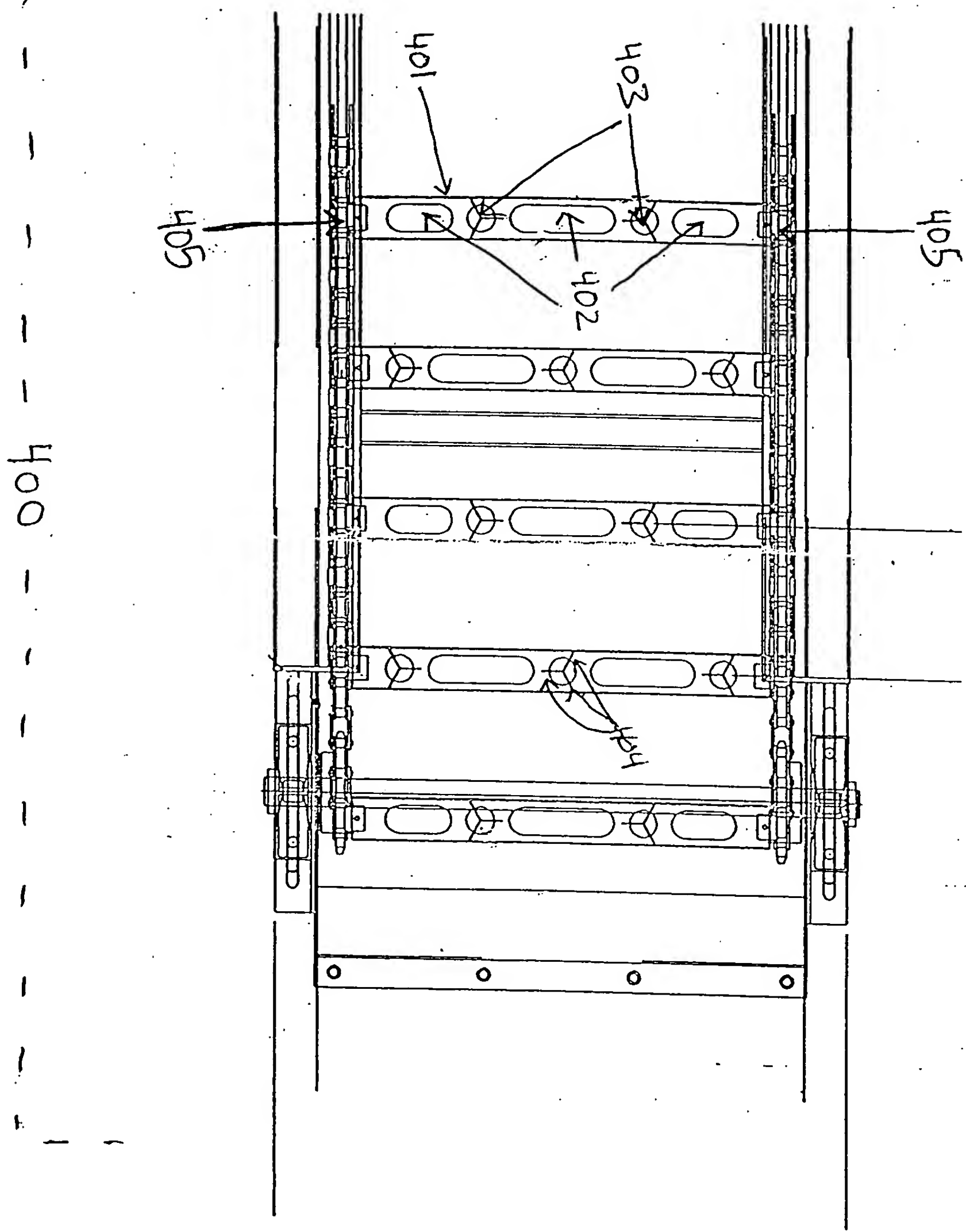


Figure 3

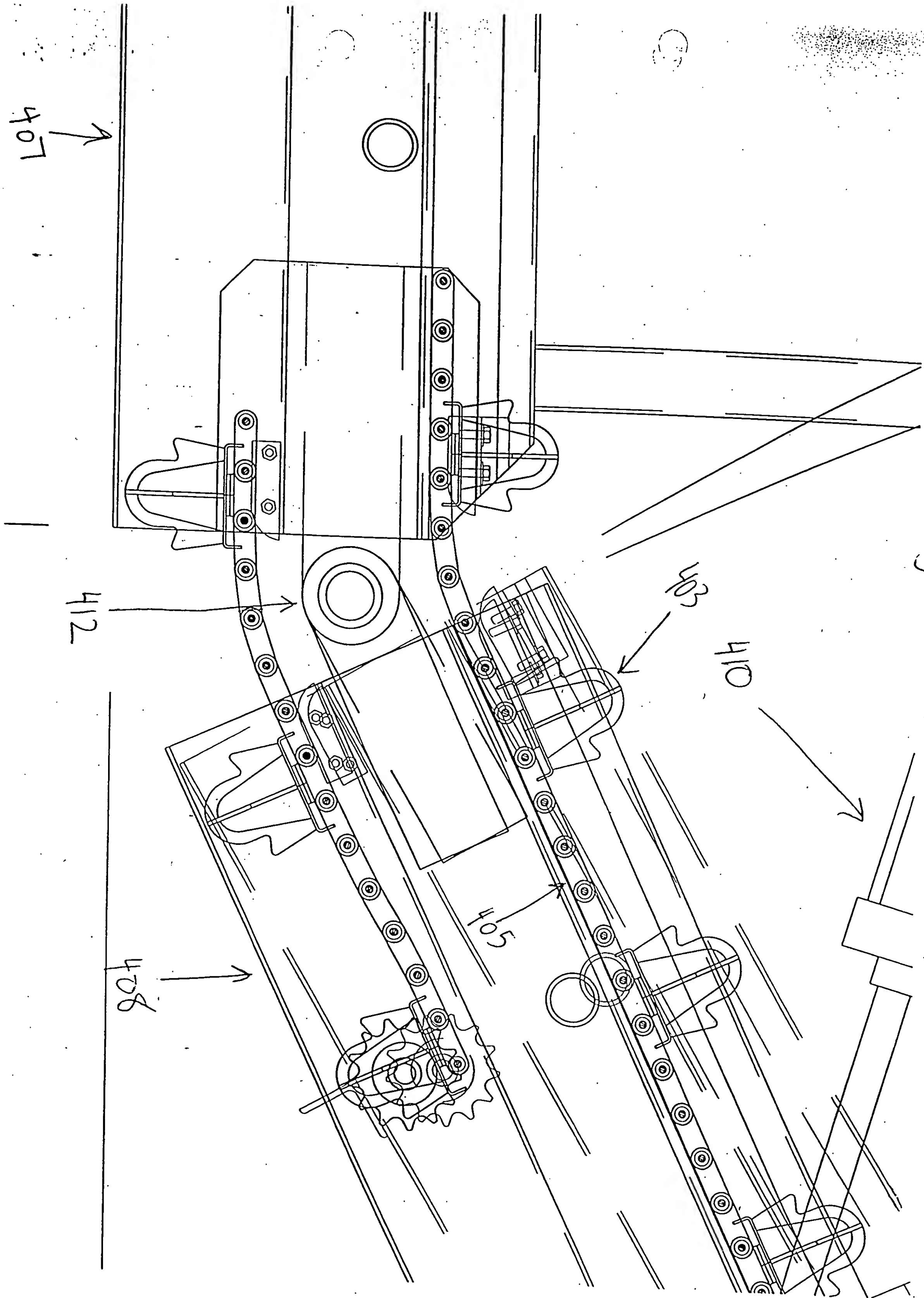


Figure 4

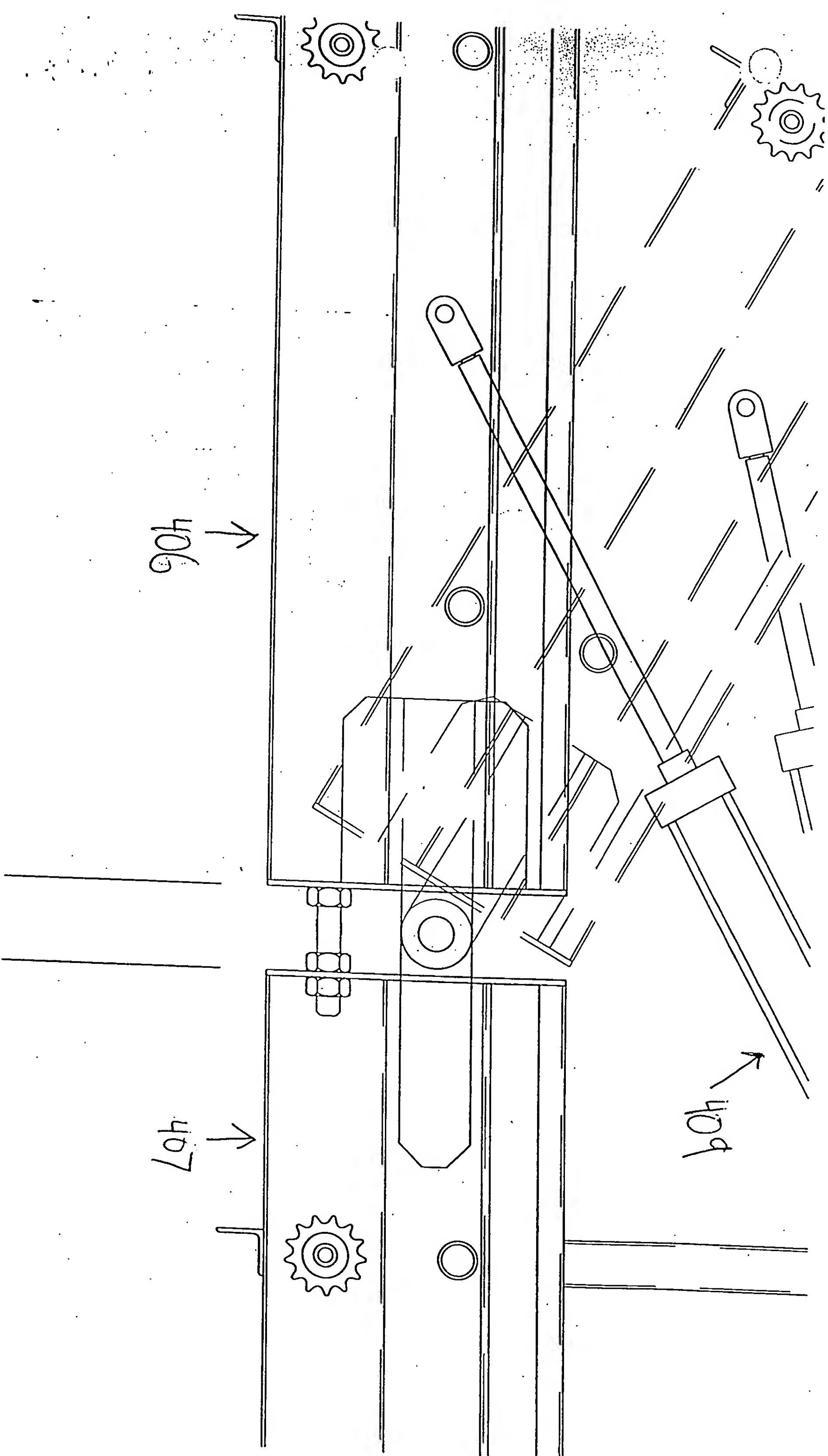




Figure 5

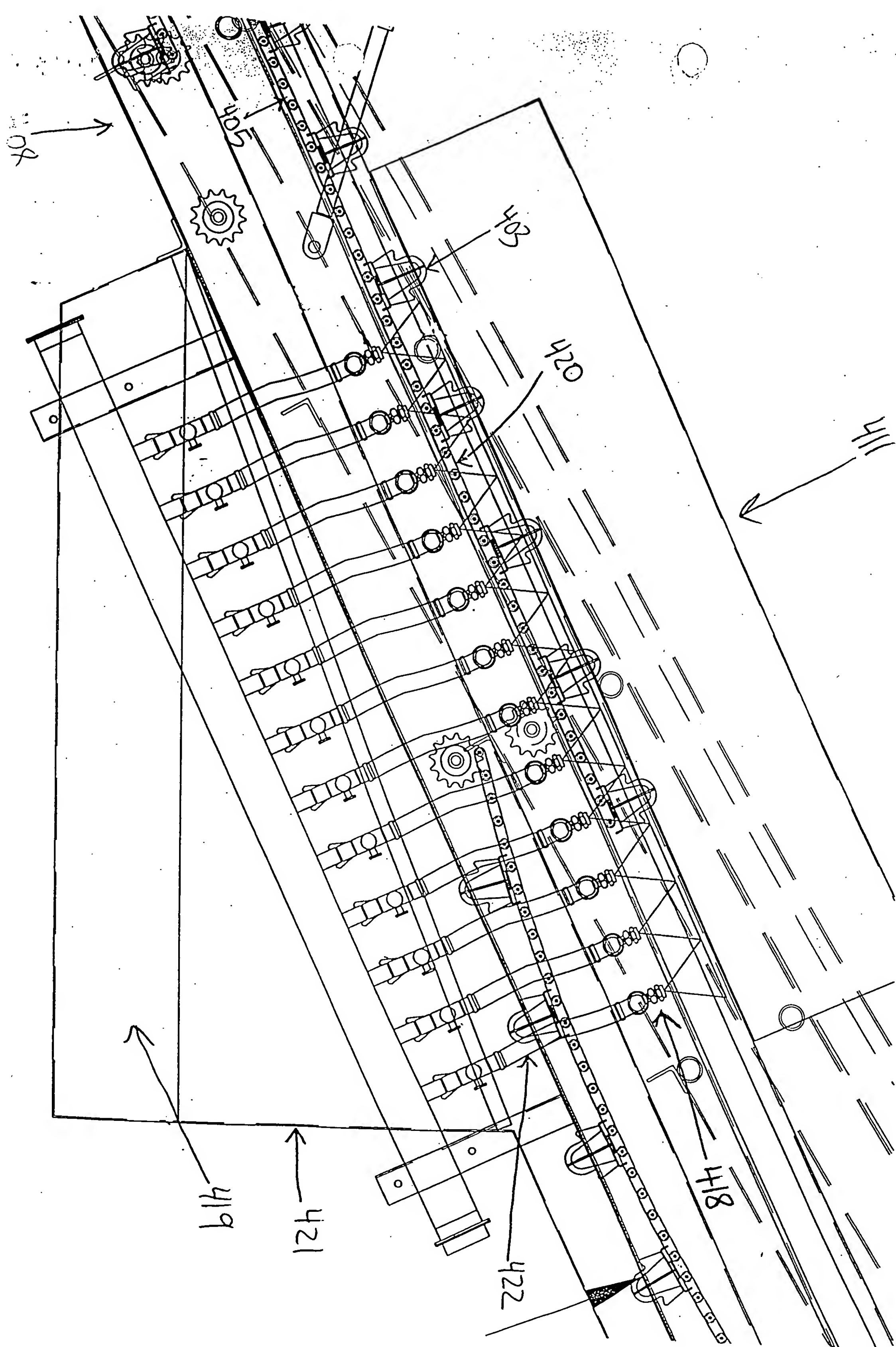


Figure 6

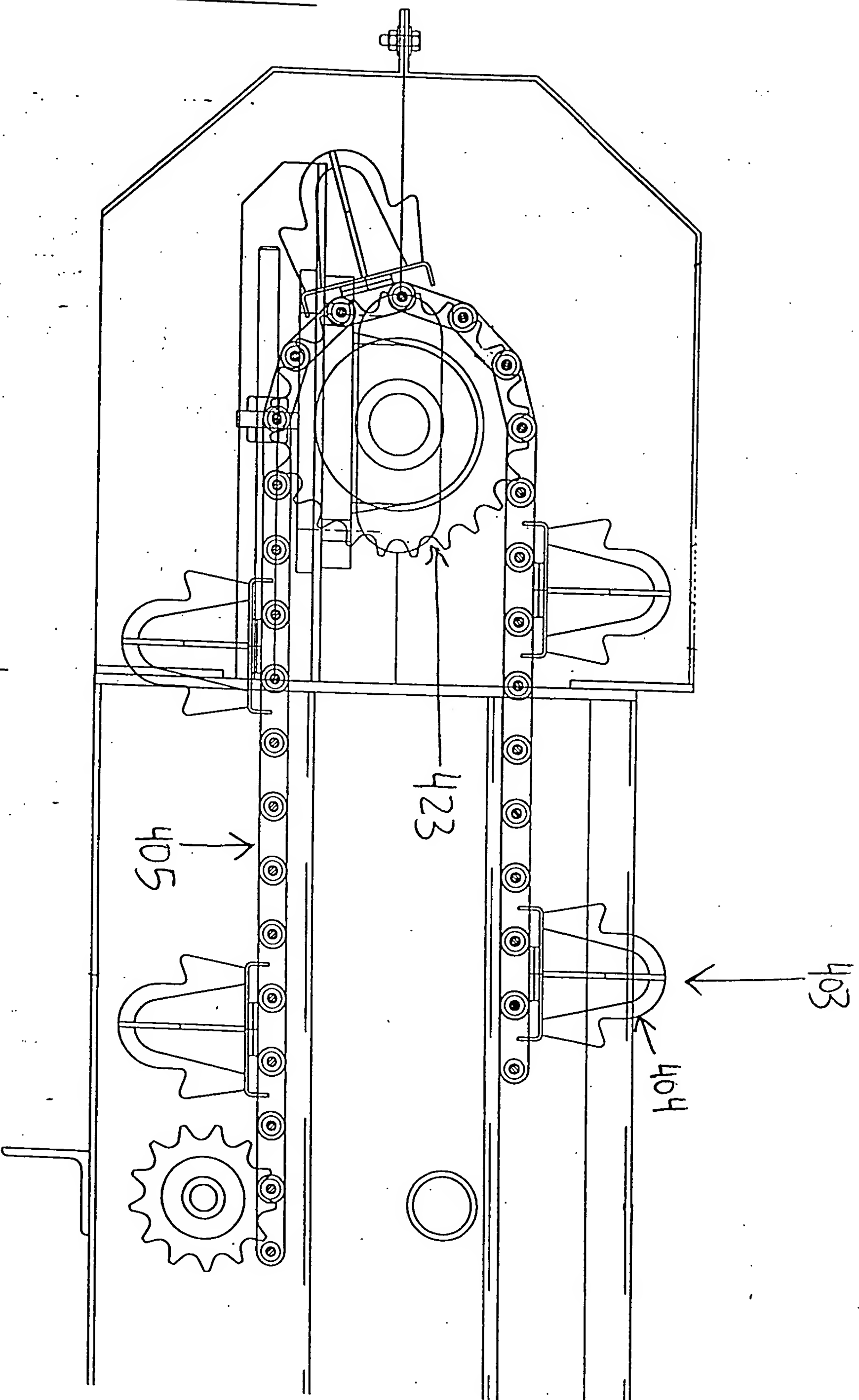


Figure 7

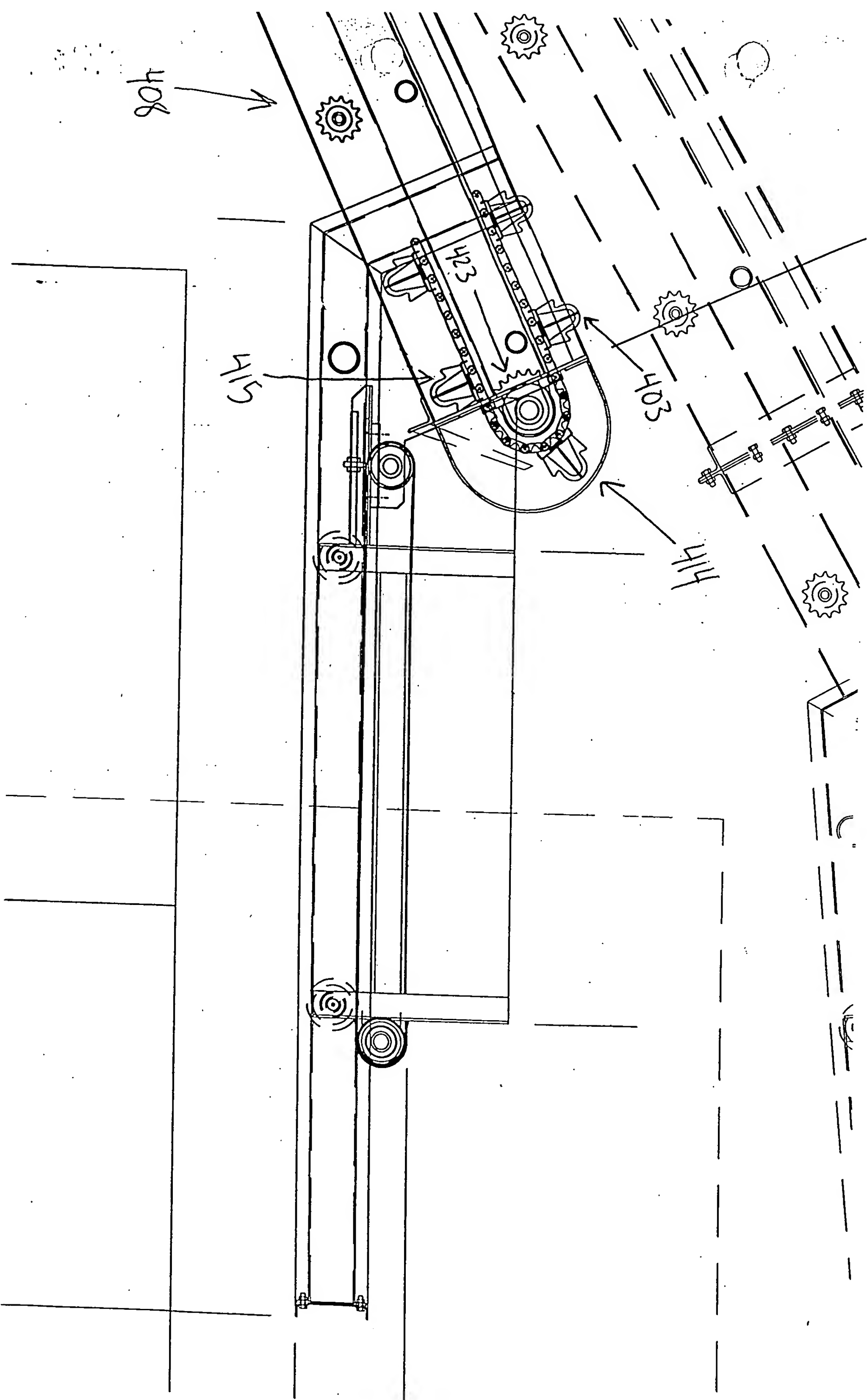


Figure 8

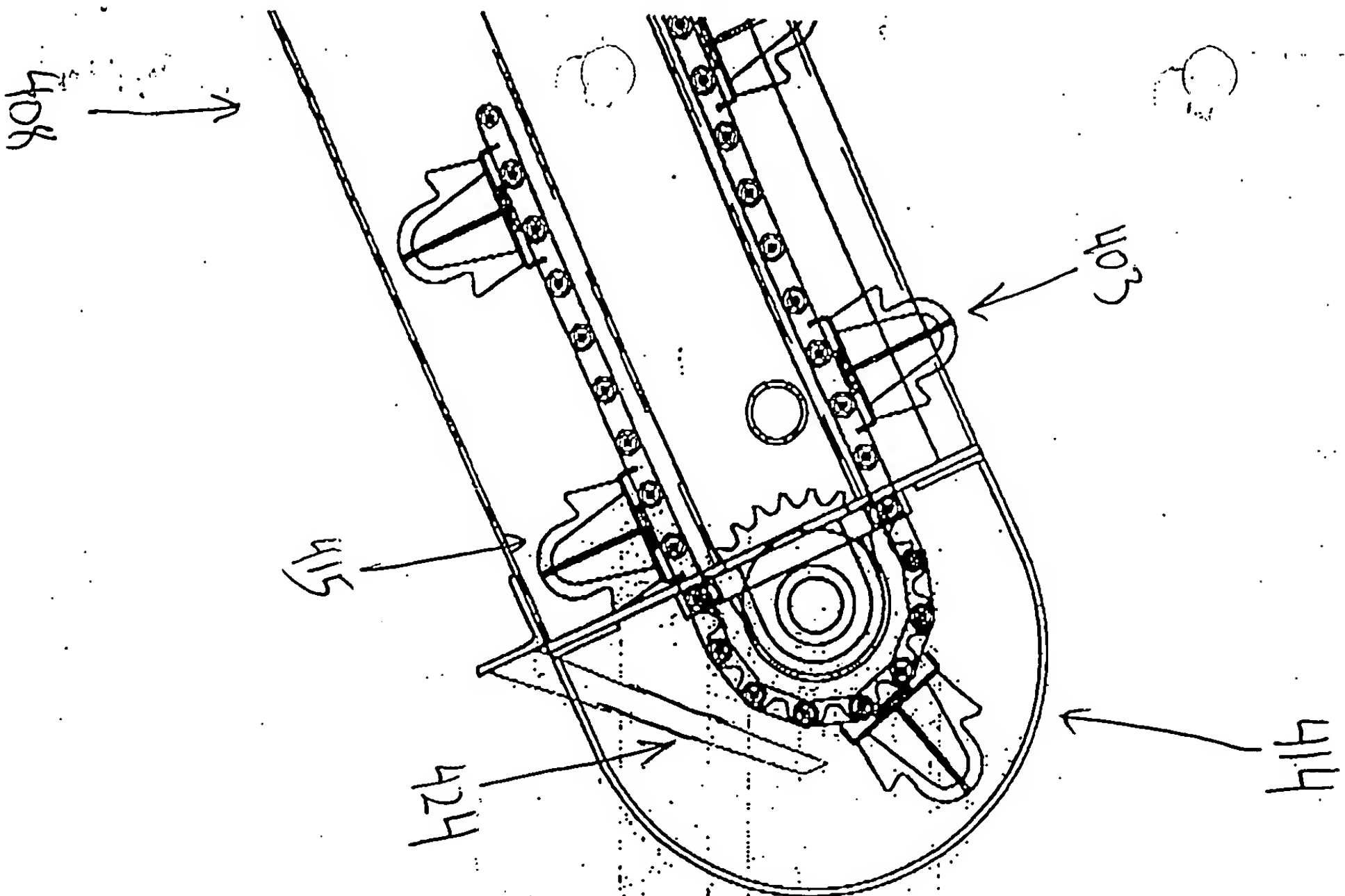
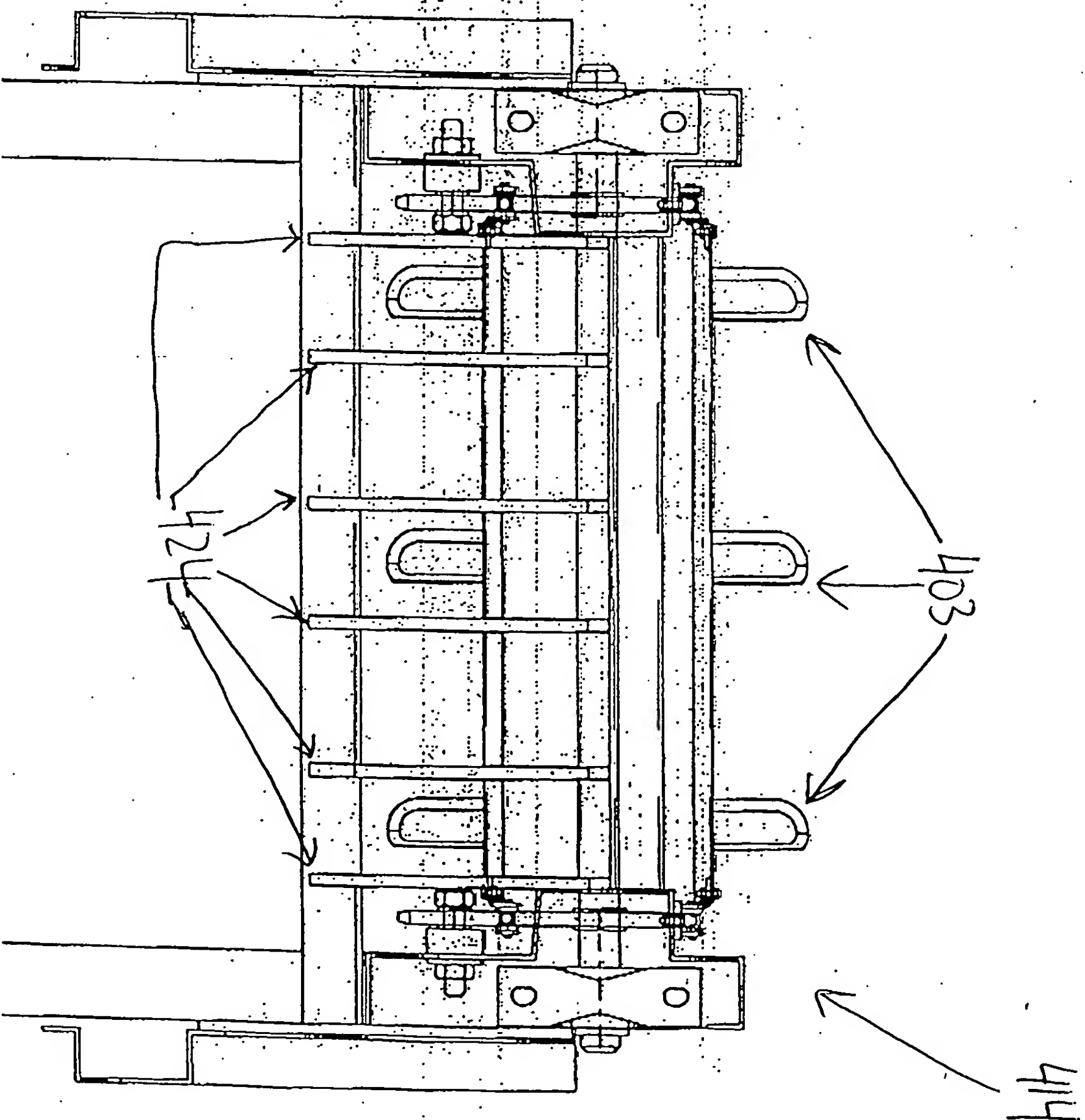


Figure 9



Docket No.  
D9359

# Declaration and Power of Attorney For Patent Application

## English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

**APPARATUS AND METHODS FOR WASHING THE CORED AREAS OF LETTUCE HEADS DURING HARVEST**

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on \_\_\_\_\_ as United States Application No. or PCT International Application Number \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

(Number)

(Country)

(Day/Month/Year Filed)

☐

(Number)

(Country)

(Day/Month/Year Filed)

☐

(Number)

(Country)

(Day/Month/Year Filed)

☐

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status)  
(patented, pending, abandoned)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status)  
(patented, pending, abandoned)

\_\_\_\_\_  
(Application Serial No.)

\_\_\_\_\_  
(Filing Date)

\_\_\_\_\_  
(Status)  
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

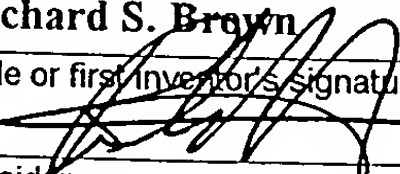
**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

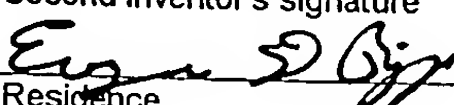
Patrick F. Bright, Reg. No. 24,318

David M. Kleiman, Reg. No. 42,744

Send Correspondence to: Patrick F. Bright  
**BRIGHT & LORIG, APC**  
 633 West Fifth Street, Suite 3330  
 Los Angeles, CA 90071

Direct Telephone Calls to: *(name and telephone number)*  
 Patrick F. Bright 213-627-7774

Full name of sole or first inventor	<b>Richard S. Brown</b>
Sole or first inventor's signature	
Date	4/13/99
Residence	34325 Chualar Canyon Road, Chualar, California 93925
Citizenship	U.S.A.
Post Office Address	Same as Residence

Full name of second inventor, if any	<b>Eugene D. Rizzo</b>
Second inventor's signature	
Date	4/13/99
Residence	90 Glen Lake Drive, Pacific Grove, California 93950
Citizenship	U.S.A.
Post Office Address	Same as Residence